

370.1 DESCRIPTION

This work shall consist of milling asphalt pavement, mixing the reclaimed asphalt pavement (RAP) material with emulsified asphalt, placing, and compacting the recycled mixture according to these specifications and the typical sections shown in the plans.

370.2 MATERIALS

The RAP material, after processing, shall have 100 percent of the material passing 1¼ inch (31.5mm) sieve and 95% of material passing a 1 inch (25mm) sieve.

The emulsified asphalt shall conform to Section 890.

370.3 CONSTRUCTION REQUIREMENTS**A. Rollers:**

Pneumatic tired rollers shall have an effective roller weight of at least 250 pounds per inch (4.5 kilograms per millimeter) of roller width or satisfactory vibratory compaction equipment. Tires shall be uniformly inflated so their air pressures will not vary by more than 5 psi. Rollers shall be operated with tire pressures and wheel loads within the manufacturer's recommended range for the size and ply of the tire being used.

Steel rollers shall furnish a minimum rolling weight of 275 pounds per inch (4.9 kilograms per millimeter) of rolling width

B. Equipment Configuration

The cold recycling equipment shall consist of a unit or a combination of units, which will satisfactorily perform the following requirements.

1. Mill the bituminous pavement and pick up the reclaimed material.
2. Process the RAP material to meet the specified gradation.
3. Mix the RAP material uniformly with the specified amount of emulsified asphalt.
4. Deposit the mixture in a windrow, or paver.
5. Place and compact the recycled mixture to the specified density with automatic line and grade controls.

C. Equipment Performance

The milling unit shall be capable of milling the asphalt concrete pavement at least five inches deep (125 mm) and a minimum of twelve feet (3.6 m) wide in a single pass. The unit shall have automatic controls capable of maintaining uniform grade and cross slope.

The RAP material processing unit shall be a crusher with a scalper screen, or other approved devices capable of reducing the RAP material to the specified gradation. The processing unit shall separate and remove strips of crack sealant from the milled material prior to mixing and weighing.

The mixing unit shall have a continuous weighing system for the processed RAP material, coupled with a meter to accurately maintain the proportion of RAP material and emulsified asphalt at the rate approved by the Engineer. The emulsified asphalt pump shall shut off automatically if delivery of RAP material is stopped.

The mixing unit shall be capable of producing a homogeneous mixture of processed RAP material and emulsified asphalt without segregation.

The emulsified asphalt metering system shall deliver the specified amount of asphalt to within 0.2 percent of the required application rate.

Positive means shall be provided for calibration of the weighing and metering devices.

D. Milling and Mixing Operation

The pavement shall be milled to the required depth and width, in one pass. The RAP material shall be processed to the required gradation and thoroughly mixed with the specified amount of emulsified asphalt. Water, in quantities approved by the Engineer, may be added to the RAP material to facilitate mixing, provided it does not adversely affect the emulsified asphalt. The recycled material shall be deposited in a windrow, or paver without segregation.

The Contractor shall have equipment available to equalize the windrow as directed.

E. Paving Operations

The recycled material shall be spread and compacted in a continuous operation confined to the minimum practical length.

The laydown machine for the recycled material shall be controlled by an automatic system for controlling grade and slope and shall establish a longitudinal profile grade and transverse slope that is referenced from a traveling stringline. The traveling stringline shall utilize either mechanical skis or non-contacting grade averaging sensors. The traveling stringline shall have a minimum effective length of 28 feet (8.5 meters). The system shall be capable of manually controlling the transverse slope.

The recycled material shall be spread and finished in one lift by an asphalt concrete laydown machine. The recycled material shall be placed and finished to within ± 0.5 percent of the cross slope shown on the typical section sheet in the plans.

The quarter crown within any 12 foot (3.6 m) transverse length (or actual lane width paved with a single paver pass) shall not exceed 0.04 feet (13 mm) when measured with a straight edge, stringline, or other suitable equipment.

F. Compaction and Density Requirements

Compaction and density requirement shall be a minimum of 97 percent of the target density. The target density shall be established in accordance with SD219 and compacted under the following conditions:

The ambient air temperature is a minimum of 60° F (15° C) and rising.

A minimum of one test strip shall be completed to determine the target density and optimum sequence of rollers. The test strip(s) will remain in place as part of the completed work.

The depth of the lift shall be representative of the project.

The Contractor shall have, as a minimum, two self propelled rollers for use on the test strips, a double drum vibratory steel roller and a pneumatic tired roller.

When there is a significant change in mix proportions, weather conditions, or other controlling factors the Engineer may require construction of another test strip(s) to check target density.

G. Prime Coat Seal and Overlay

The Contractor shall be required to determine the amount of moisture in the processed material prior to proceeding with the Prime Coat Seal and/or Overlay. The moisture tests are for monitoring only and are not for acceptance. The frequency of testing shall be performed at a minimum of one per mile per lane processed. The Department will randomly determine sample locations at the determined frequency and ensure that the Contractor obtains samples by approved methods. The Contractor shall perform additional moisture tests on a weekly basis from the same area as the initial sample locations, until the processed material has reached specification. Results of the moisture tests shall be recorded on a DOT-35 and provided to the Engineer. Moisture content shall be determined by SD108, 2.4, Oven Drying Method only.

The recycled asphalt concrete material shall be primed. The asphalt prime coat seal or the asphalt concrete overlay shall not be placed until the moisture content of the recycled mixture is less than 1.5 percent. The prime coat and blotter material shall be applied as specified in the plans.

With the Engineer's approval, the Contractor may be allowed to pave without priming the recycled material providing that paving starts within two weeks from when the recycled material has cured to less than 1.5 percent moisture. When priming is not performed with the Engineer's approval, the items required for priming and blotting will be deleted or appropriately reduced by CCO.

The Contractor, at no cost to the Department, shall patch all potholes and ravelling of the prime and or recycled material prior to paving.

H. Weather and Seasonal Limitations

Milling, mixing, and laydown of RAP shall be completed only when:

1. The ambient air temperature is 60° F (15° C) and rising.
2. Rain or foggy conditions do not exist.
3. The cold recycling shall only be performed as noted above from May 1 to September 15.

I. Traffic Control

| Recycling activities will be permitted from sunrise to sunset.

At the end of cold recycling activities each day, the Contractor shall open the roadway to normal two-way two-lane traffic.

If recycling segments are incomplete at the end of the day, the Contractor shall, at no additional cost, place granular material, on the incomplete segment, to provide a temporary driving surface which is stable and will drain free of standing water. All longitudinal, vertical edges shall be beveled to a 12:1 slope with the temporary granular material.

370.4 METHOD OF MEASUREMENT

Cold recycling shall be measured to the nearest square yard (square meter).

Asphalt for cold recycling shall be measured to the nearest 0.1 ton (0.1 metric ton).

370.5 BASIS OF PAYMENT

| The basis of payment for cold recycling shall be plans quantity unless changes in quantity are ordered in writing by the Engineer. The contract unit price shall include all costs for milling, water, water application, asphalt application, blending, laydown and compaction, test strips, including all equipment, labor, and incidentals required to satisfactorily complete the work.

The payment for asphalt for cold recycling shall be considered full payment for the asphalt, transportation, handling, storage, labor, and all incidentals required.